



Agile Testing of Whole Web Applications

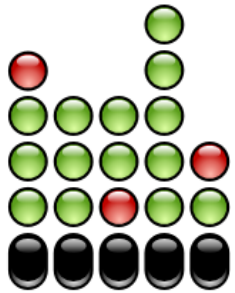
Adam Skogman

Project Lead, DDSteps

Senior Java EE Consultant, Jayway AB

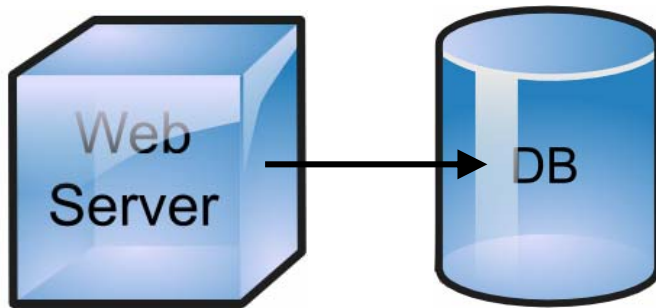
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DDSteps in 1-2-3



Data Driven

Repeat Test with Different Data



Killer App

Web + Database Testing



100% JUnit Compatible

Already Integrated

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Teaser Trailer

Data Driven Testing

Unit Testing in LdapTemplate

, + " \ / < > ;
\# \, \+ \" \\ \ / \< \> \;

```
public void testNameEncode_old() {  
    nameEncode( "# , + \" \\ / < > ;");  
    assertEquals( "\\# \\, \\+ \\\" \\ \\ / \\< \\> \\;"...  
}
```

```
public void testNameEncode() throws Exception {  
    nameEncode(plain);  
    assertEquals(encoded, x);  
}
```

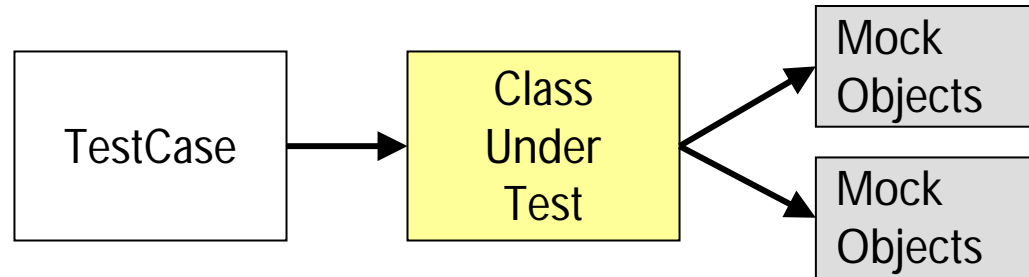
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DDSteps Demo

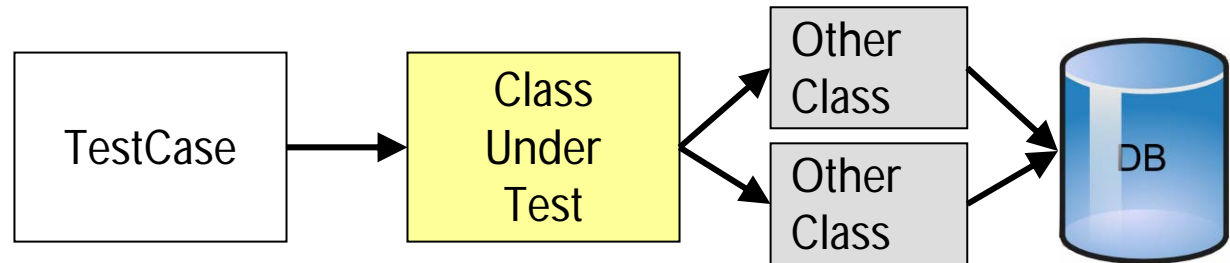
It's Just a Couple of .jars in your Classpath

When to Use DDSteps

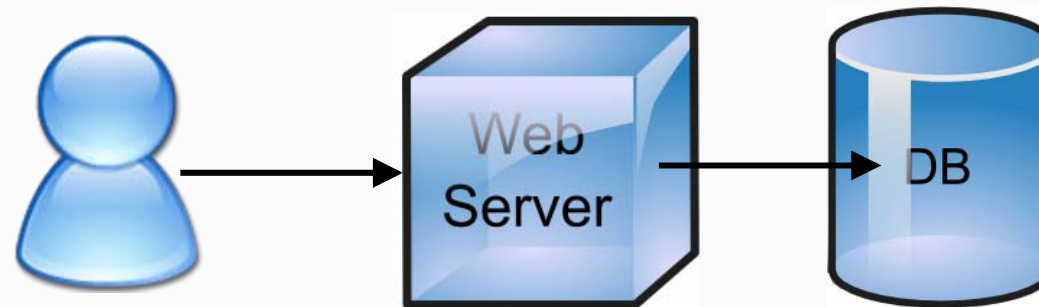
Unit Test



Integration Unit Test

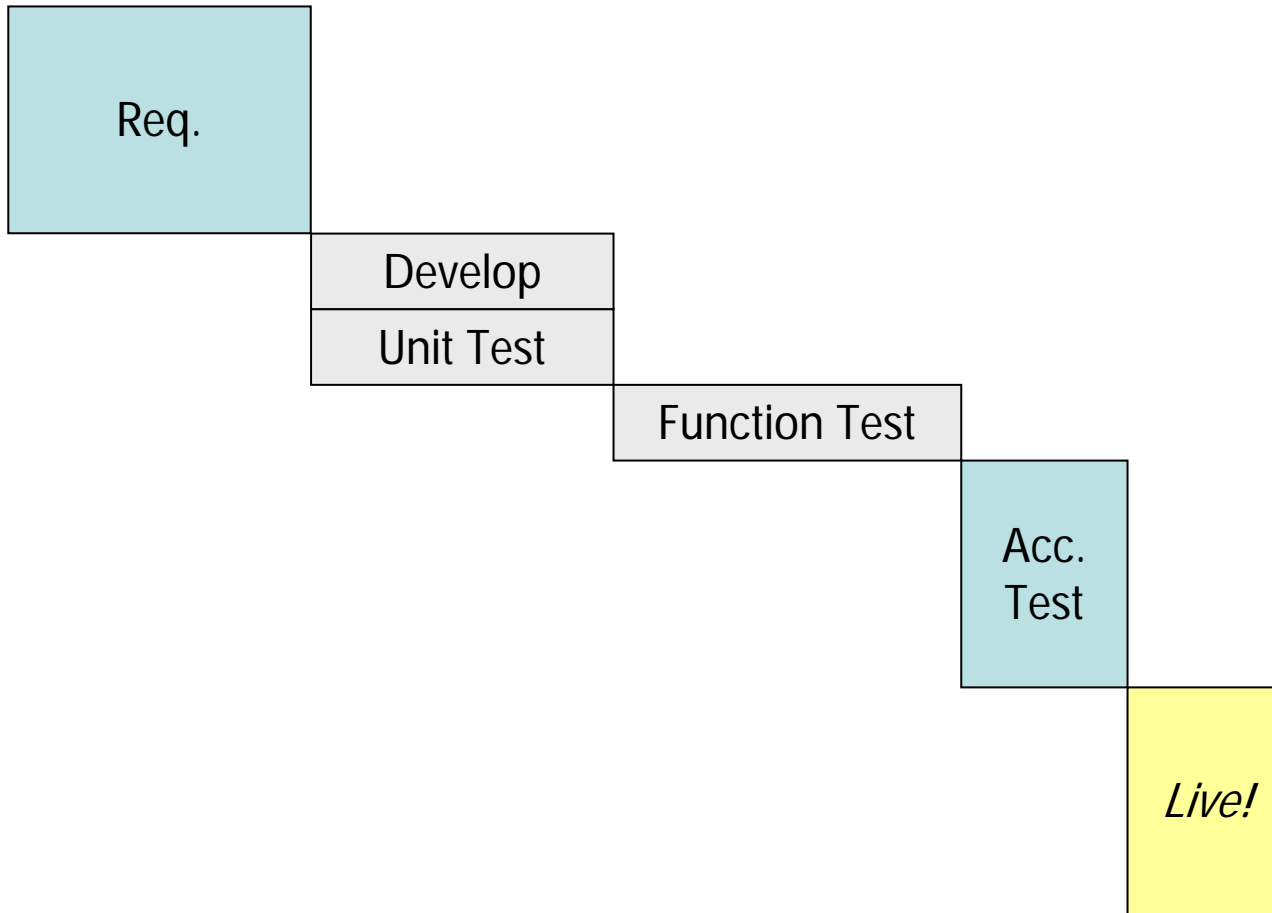


Function Test



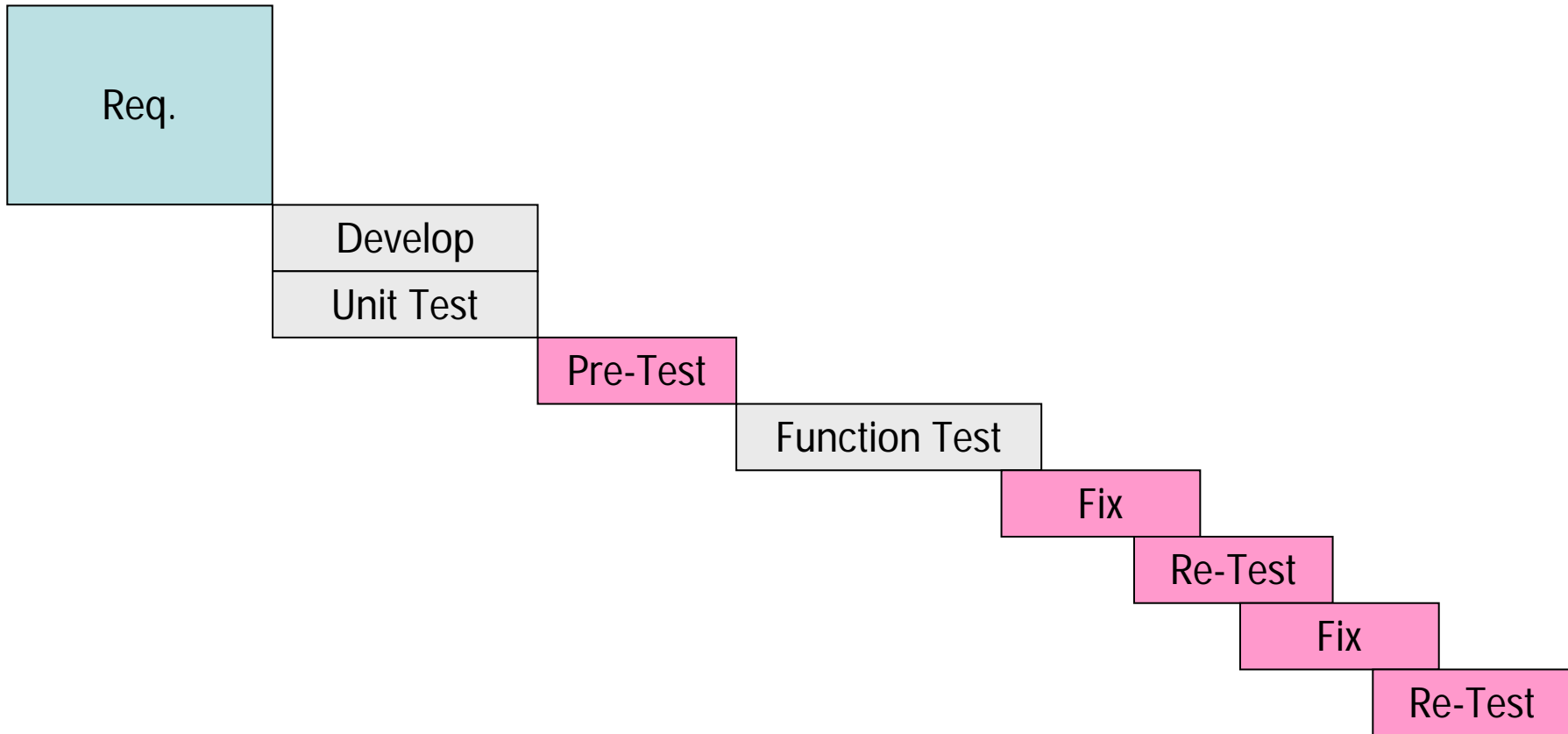
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Waterfall is so '80s



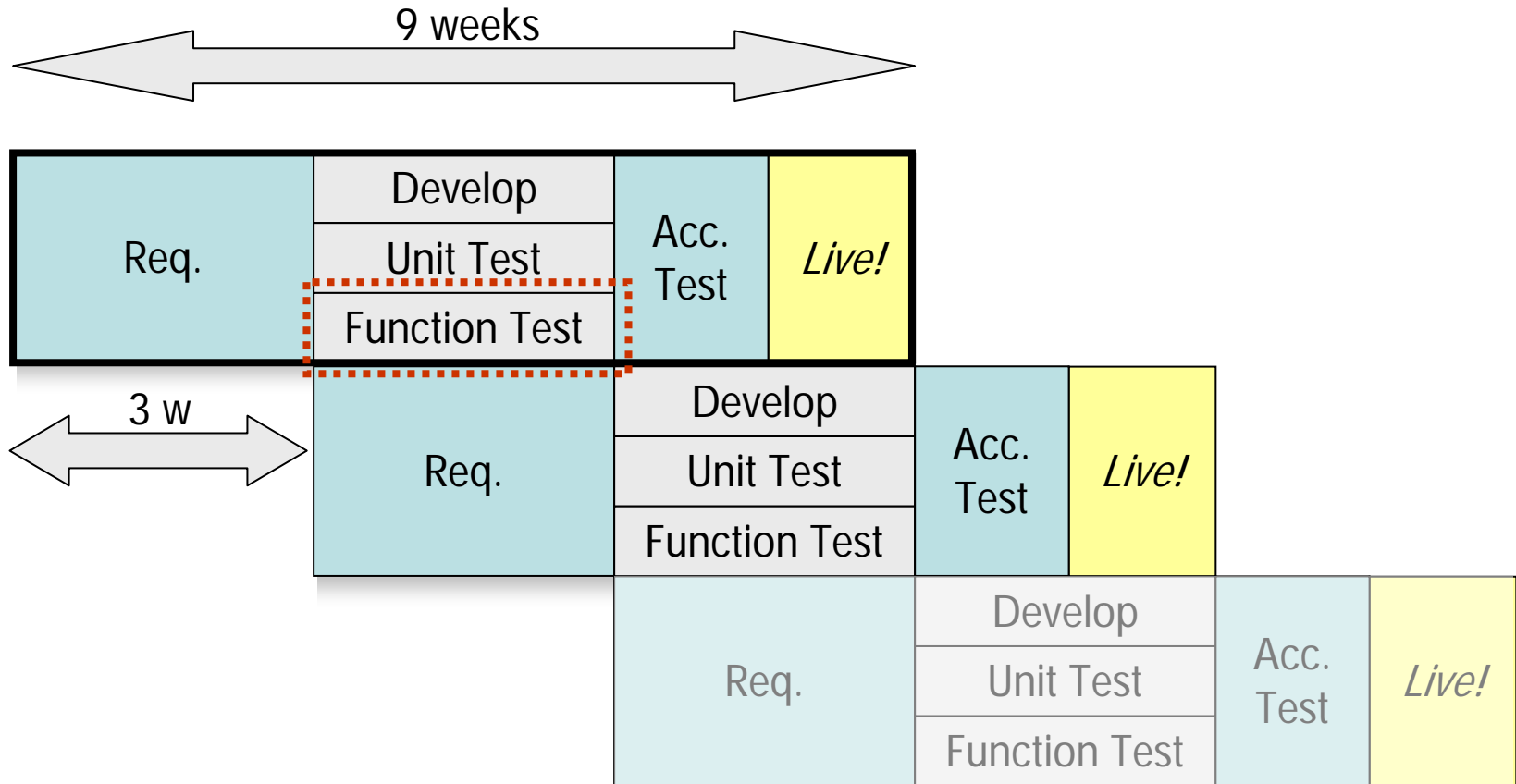
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Bugs? Who knew...



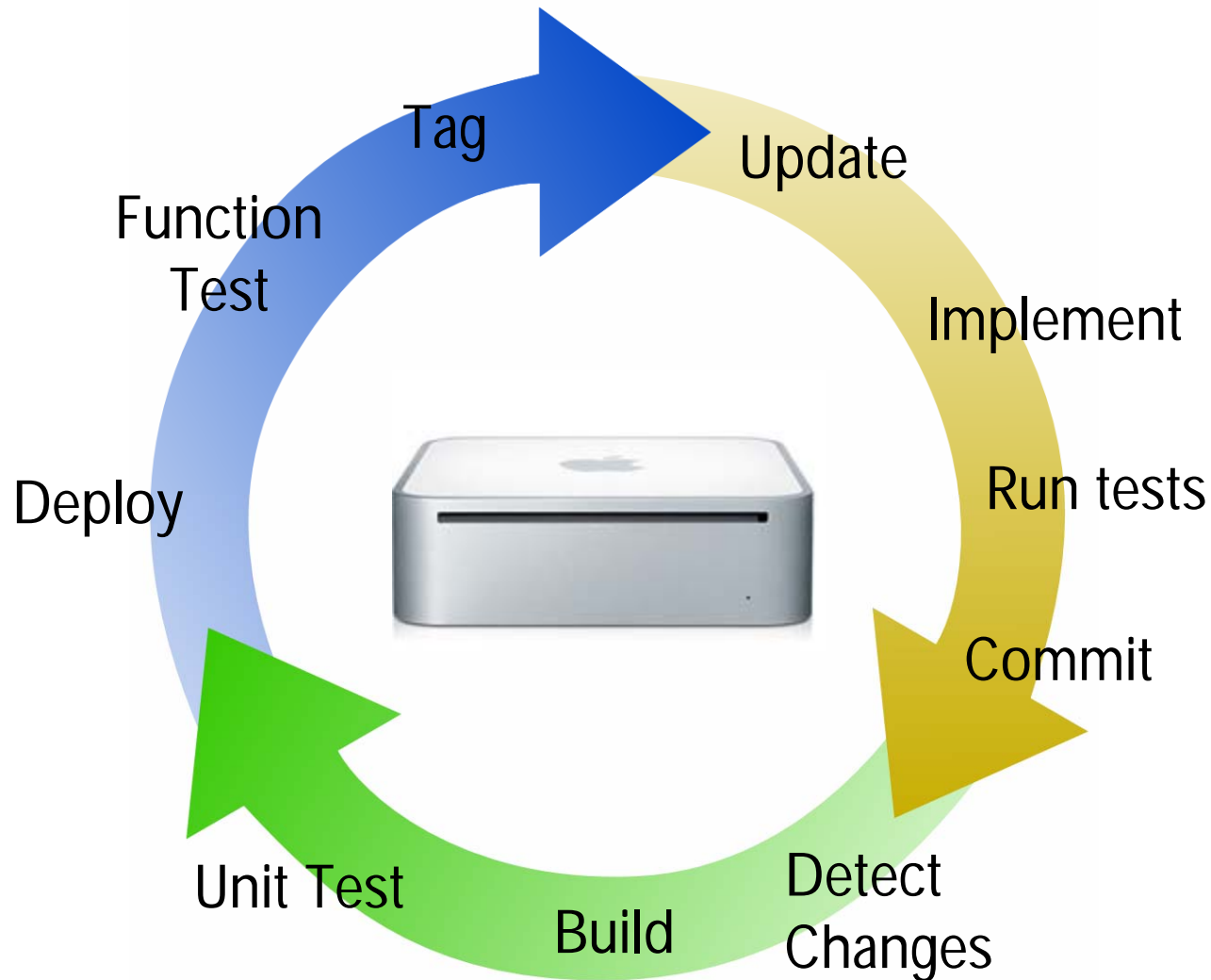
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DDSteps is Agile



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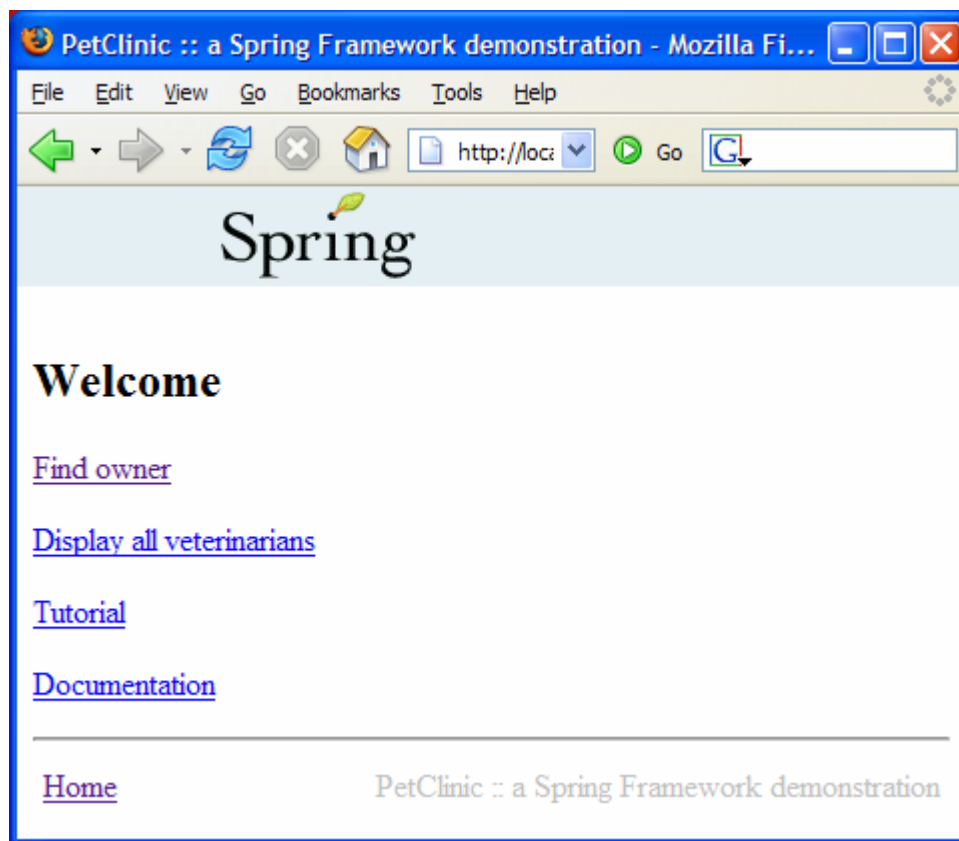
DDSteps is Continuous Integration



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Guest Staring: Pet Clinic

Out of the Box!



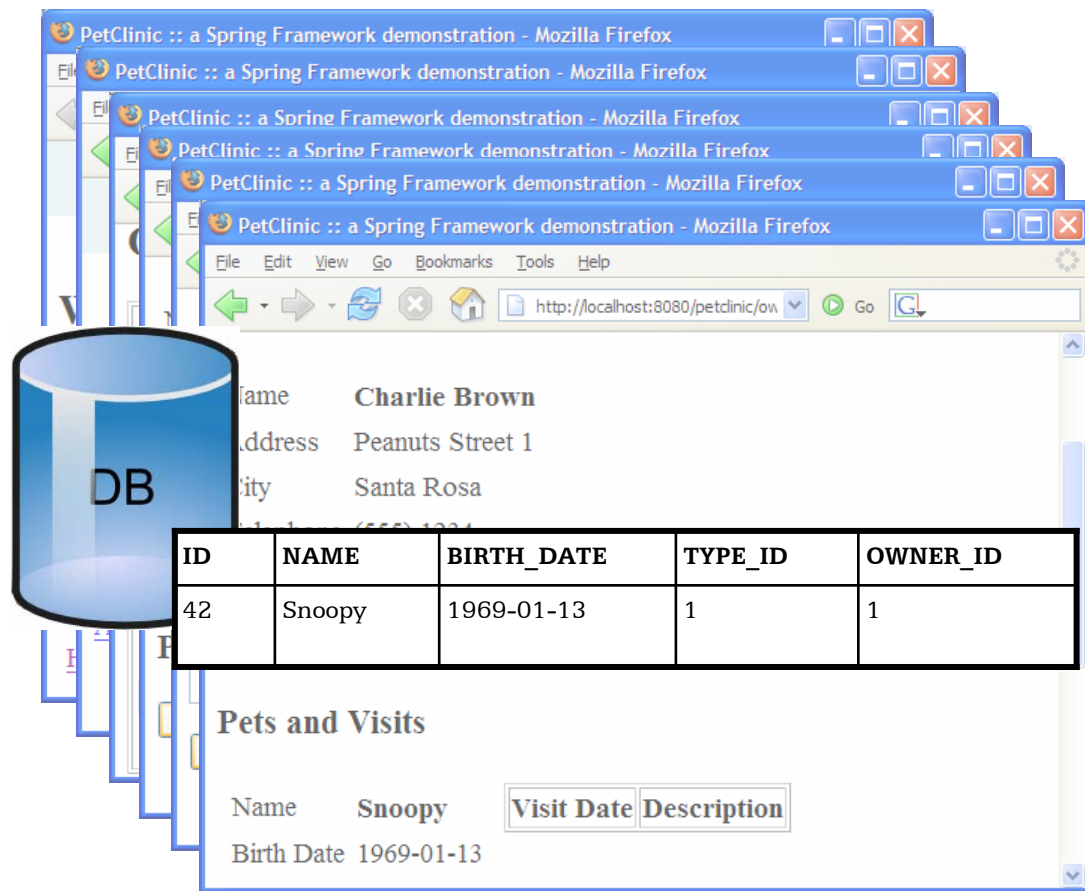
:: Example from the Spring Framework™

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It's just Complicated

:: Add New Pet (OK)

1. Log in
2. Click "Find Owner"
3. Click "Find Owners"
4. Click "Charlie Brown"
5. Click "Add New Pet"
6. Validate defaults
7. Enter data
 1. "Snoopy"
 2. "1969-01-13"
 3. "Dog"
8. Click "Add Pet"
9. Validate owner page
10. Validate database



The screenshot shows a web browser window displaying the PetClinic application. The browser window title is "PetClinic :: a Spring Framework demonstration - Mozilla Firefox". The address bar shows "http://localhost:8080/petclinic/ow". The page content includes a form for finding an owner, with the following details:

Name: Charlie Brown
Address: Peanuts Street 1
City: Santa Rosa

A database icon labeled "DB" is overlaid on the page, with a table showing the pet record for Snoopy:

ID	NAME	BIRTH_DATE	TYPE_ID	OWNER_ID
42	Snoopy	1969-01-13	1	1

Below the table, the "Pets and Visits" section is visible, showing the name "Snoopy" and birth date "1969-01-13".

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DDSteps

Software Engineering

1. Pull Out the Data

:: Add New Pet (OK)

1. Log in
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7. Enter data
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8. Click "Add Pet"
9. Validate owner page
10. Validate database

:: Properties

- Owner Full Name
- Pet Name
- Pet Birth Date
- Pet Type

Data duplication!

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Put it in a Spreadsheet

Microsoft Excel - PetTest.xls

Header = Property

One File = One JUnit Test Case

File name 1:1 Class Name

One Row = One Run

Sheet Name = Method Name

owner	name	birthDate	type
Charlie Brown	Snoopy	1950-10-04	Dog
Charlie Brown	Woodstock	1970-06-22	Bird
Calvin	Hobbes	1985-11-18	Tiger
Christopher Robin Milne	Winnie The Pooh	1925-12-24	Bear
'Weird Al' Yankovic	Harvey, the Wonder Hamster	1985-01-01	Hamster

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2. Break up the Test into steps

:: Add New Pet (OK)

- | | |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N | <ol style="list-style-type: none">1. Log in2. Click "Find Owner"3. Click "Find Owners"4. Click <i>Owner</i>5. Click "Add New Pet" |
| V | <ol style="list-style-type: none">6. Validate defaults |
| E | <ol style="list-style-type: none">7. Enter data<ol style="list-style-type: none">1. <i>Pet Name</i>2. <i>Pet Birthdate</i>3. <i>Pet Type</i>8. Click "Add Pet" |
| V | <ol style="list-style-type: none">9. Validate owner page |
| V | <ol style="list-style-type: none">10. Validate database |

:: Navigators

- Gets you there
- Composites

:: Executors

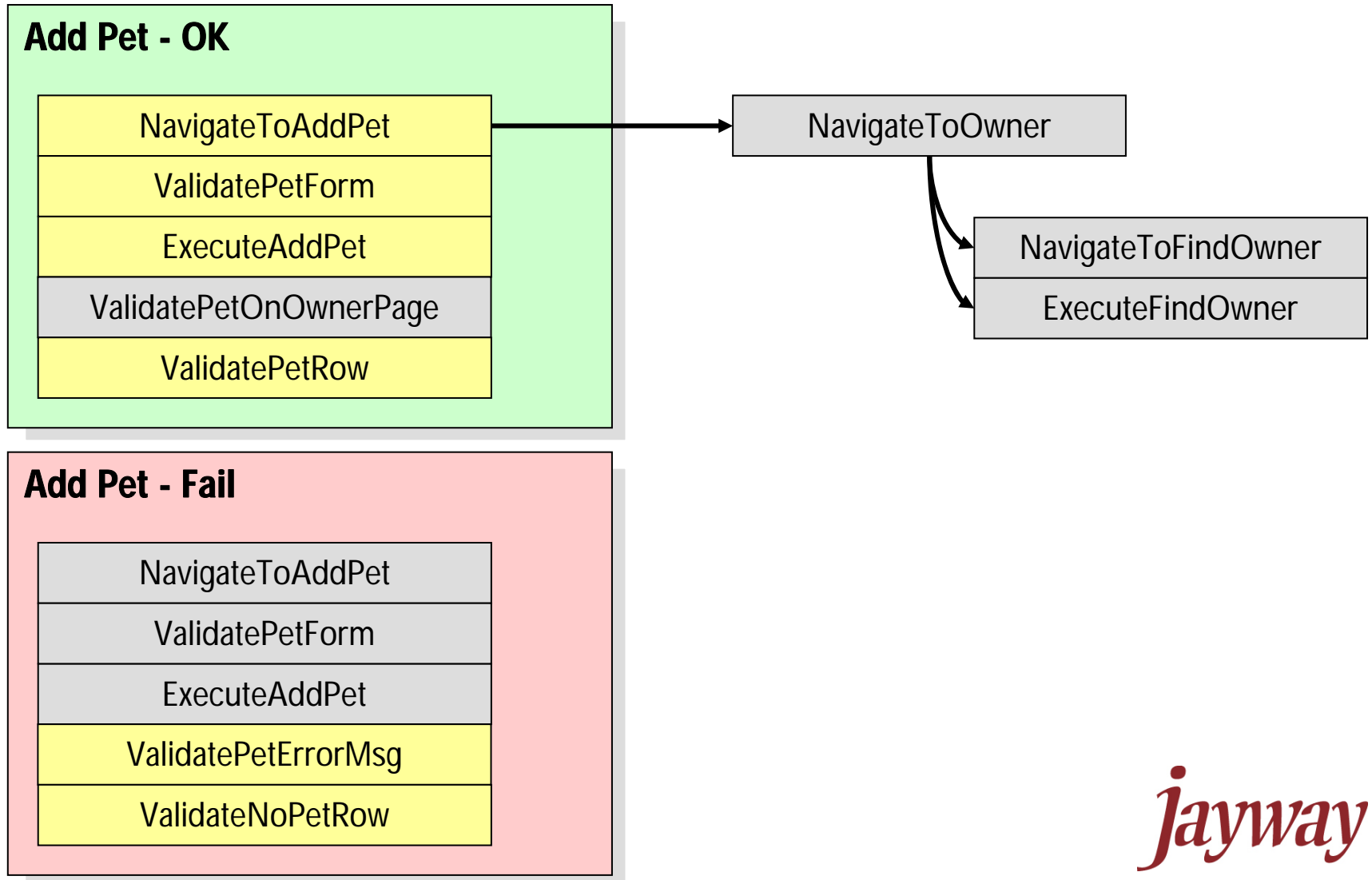
- Enter input

:: Validators

- Check output

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Tests from Test Steps



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3. DbUnit Fixture Data

ID	FIRST_NAME	LAST_NAME	ADDRESS	CITY
1	Charlie	Brown	Peanuts Street 1	Santa Rosa
2	Calvin	?	Philosophers Street 13	Chagrin Falls
3	Christopher Robin	Milne	The Forrest	East Sussex
4	'Weird Al'	Yankovic	Polka Street	Spatula City

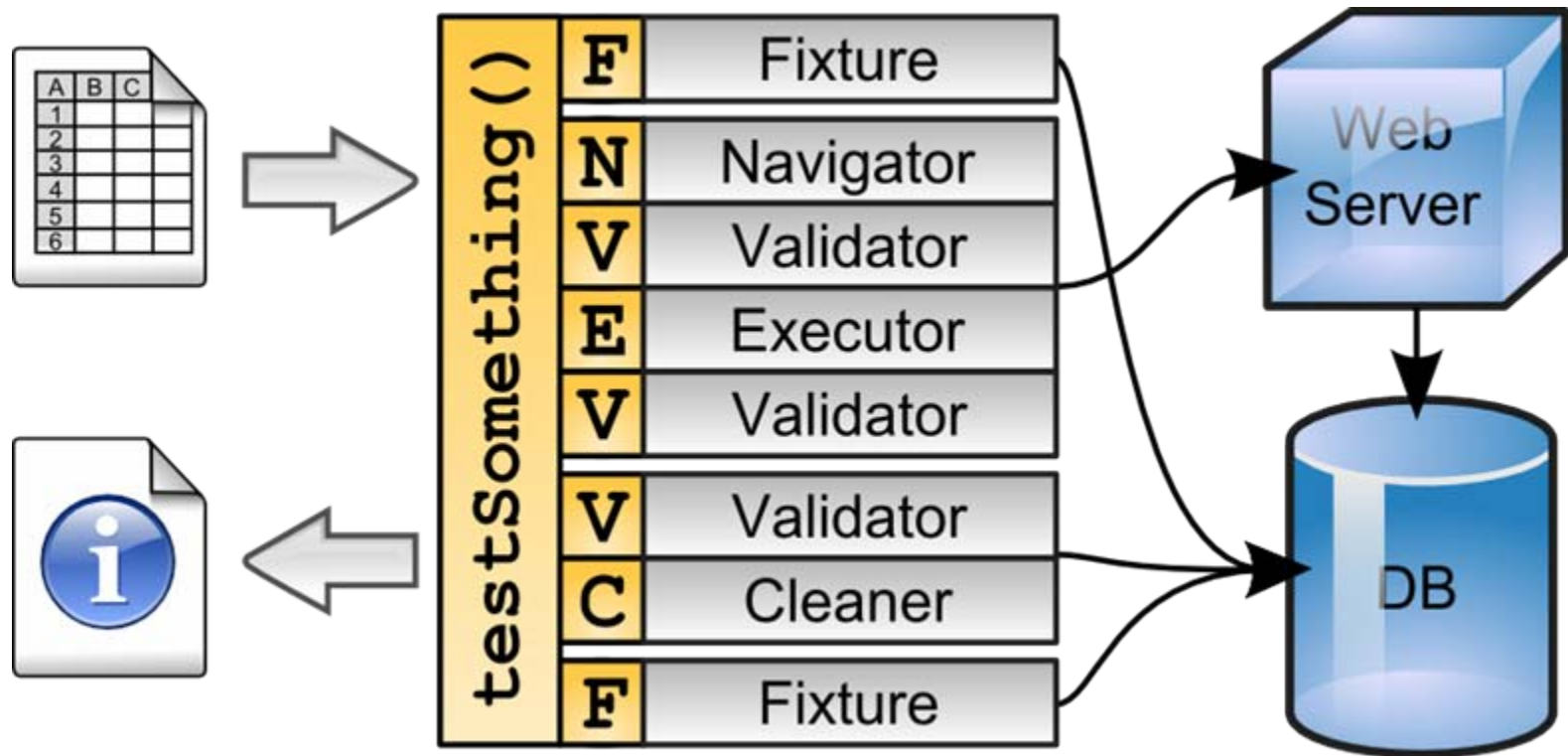
First Row
=
Column Name

Excel
Ranges

Sheet Name
=
Table Name

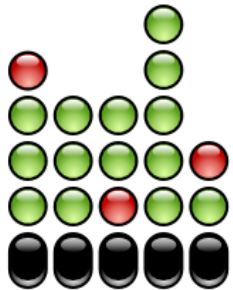


The Big Picture



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Problem Solved



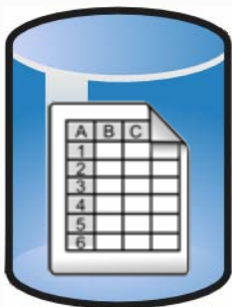
Data Driven

Repeat Tests with Different Data



Test Steps

Test Composition & Reuse



Fixtures

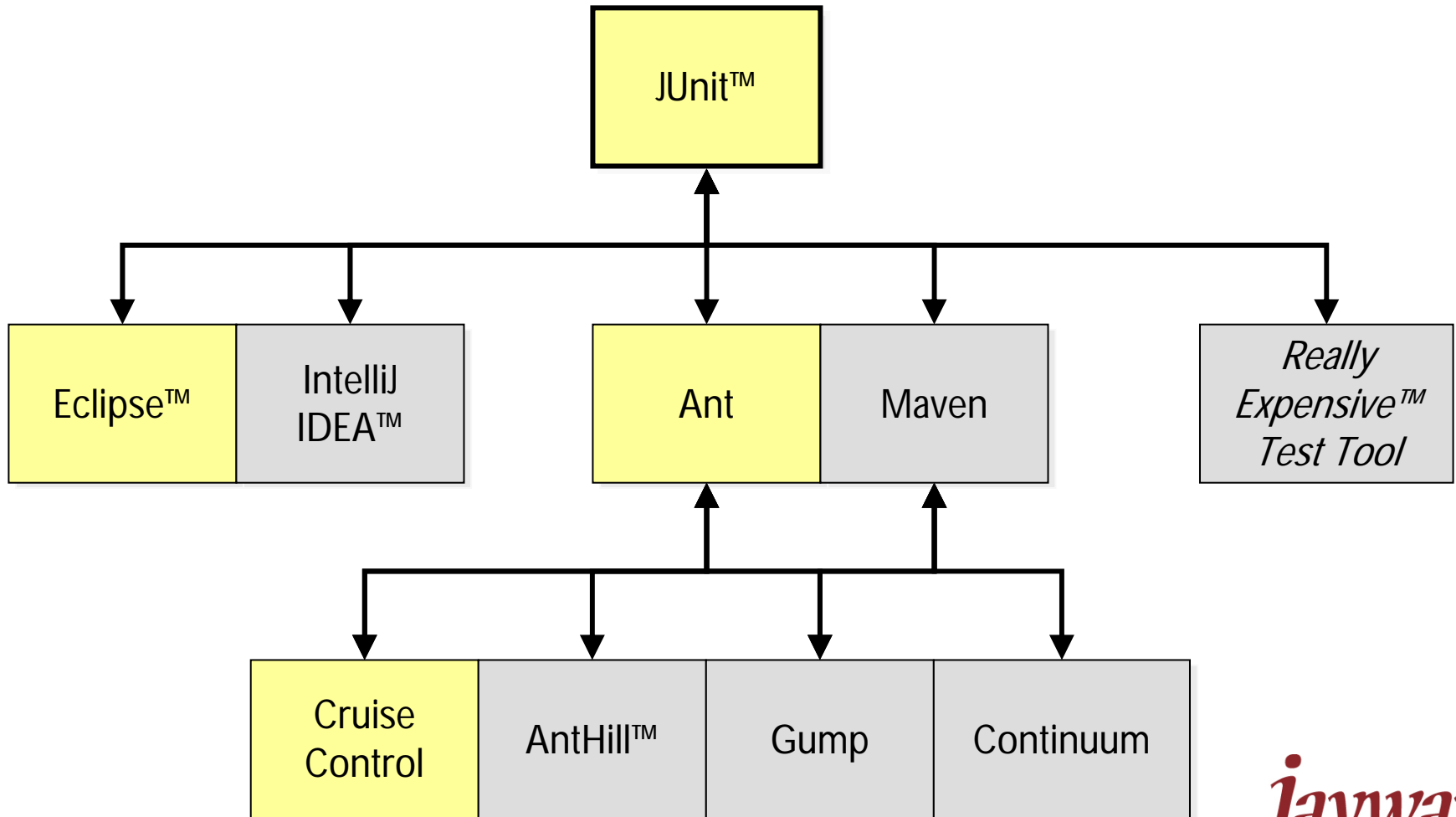
Powerful Base Data Management

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Bits and Bytes

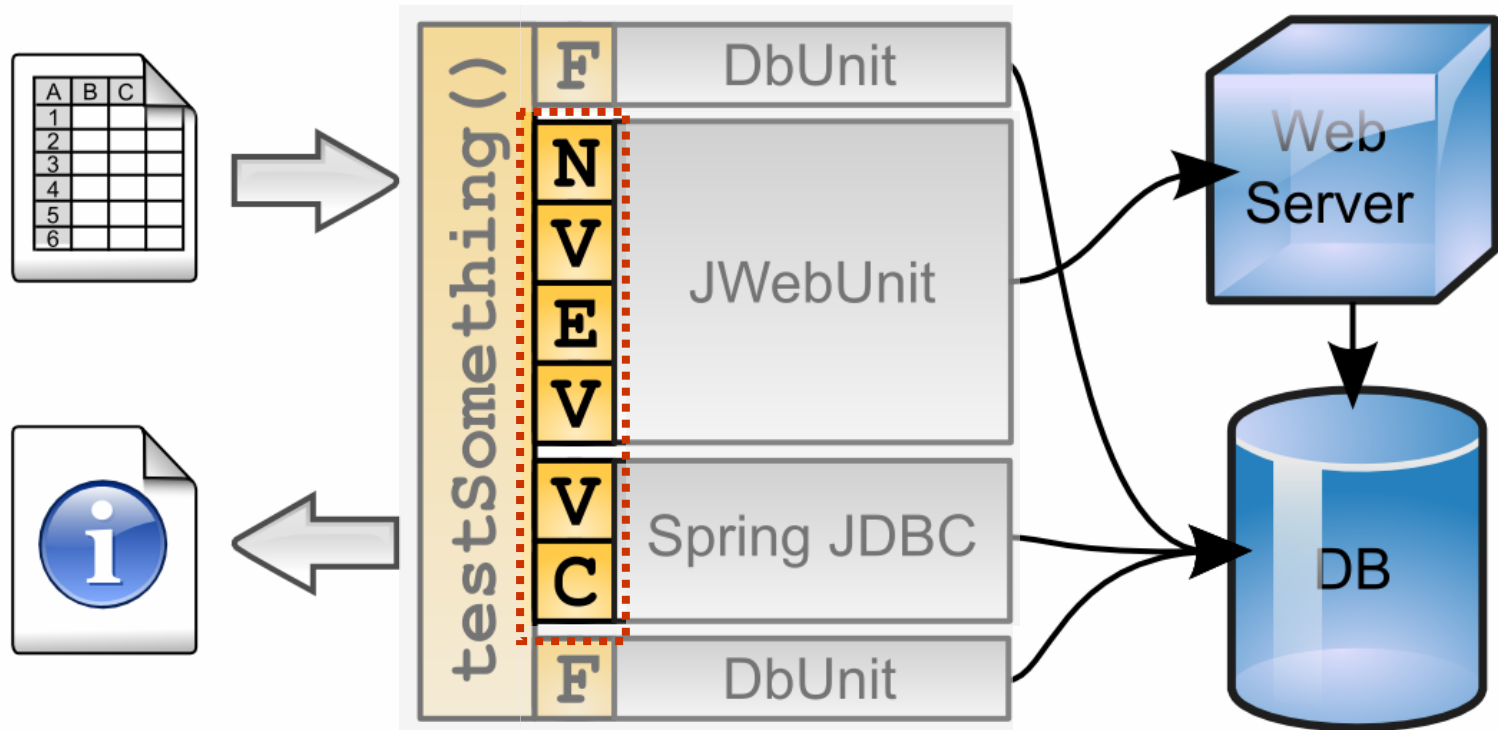
Integrating the Best-of-Breed

DDSteps is Already Integrated



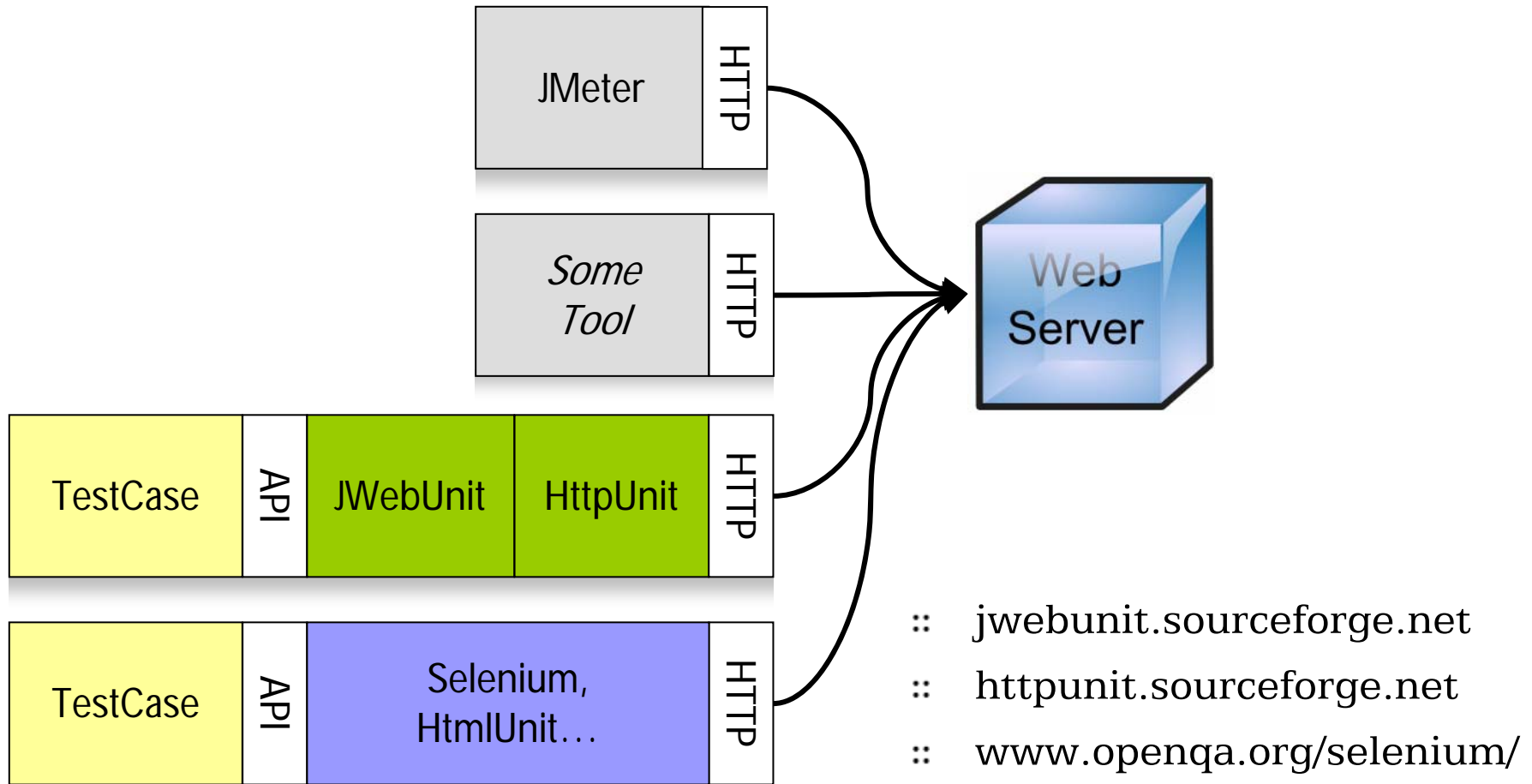
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Testing with DDSteps



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Web Browser API



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Web Browser API

:: Navigate

```
clickLinkWithText( "Find owner" );  
clickLinkWithImage( "...next.png" );
```

:: Execute

```
setFormElement( "name", "Snoopy" );  
selectOption( "type", "Dog" );  
checkCheckbox( "fictional" );  
clickButton( "Add" );  
submit( "Finish" );
```

:: Validate

```
assertTitleEquals( "Login Page" );  
assertFormElementEquals( "name", "Snoopy" );  
assertTextInElement( "owner",  
                    "Charlie Brown" );
```

The logo for Jayway, featuring the word "jayway" in a stylized, red, cursive font.

Web TestStep

```
public class ExecuteAddPet
    extends WebBrowserTestStep {

    protected String name;
    public void setName(String name){...}

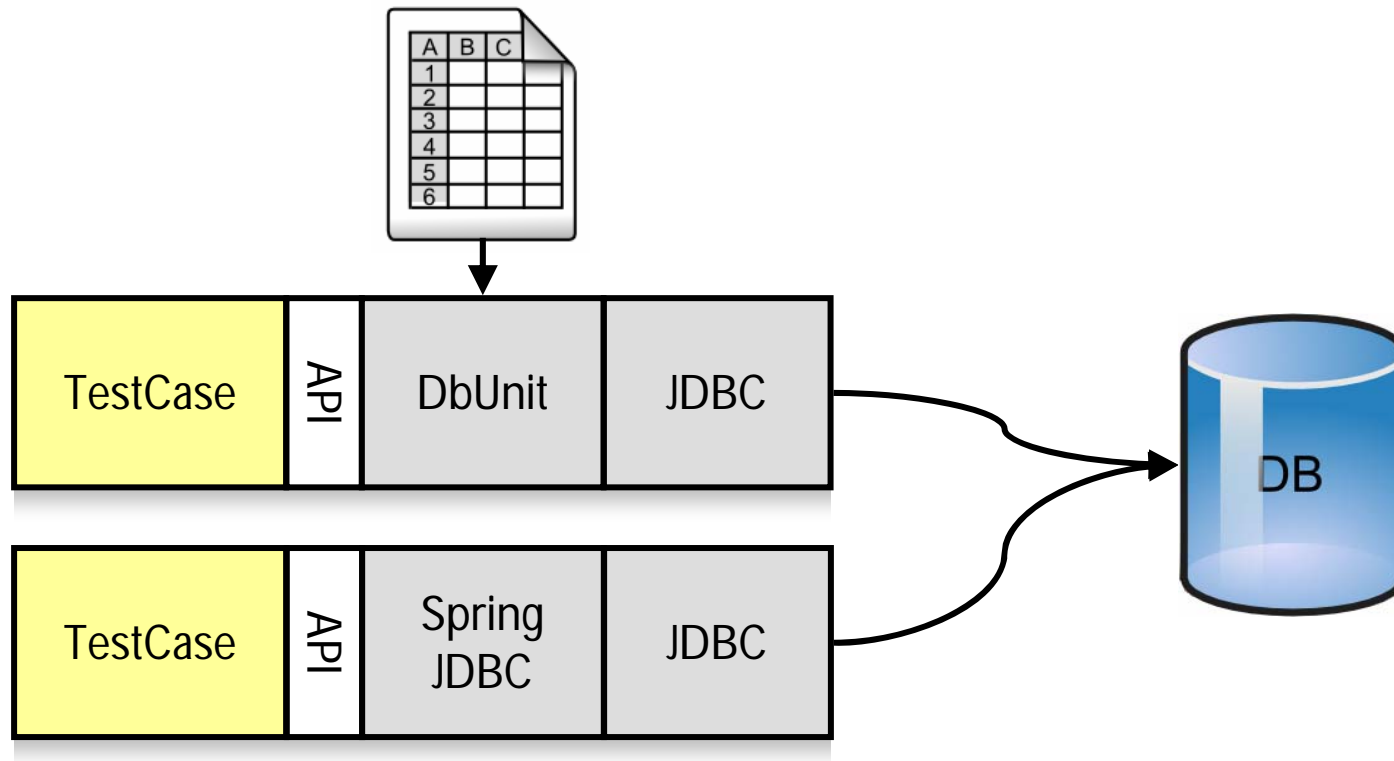
    public void runStep() throws Exception {
        setFormElement("name", name);
        setFormElement("birthdate", birthdate);
        selectOption("typeId", type);

        submit();

        writeTrail("After Execute Add Pet");
    }
}
```



DbUnit and Spring JDBC



:: www.dbunit.org

:: www.springframework.org

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Spring JDBC Validator

Just like
Mapping-
SqlQuery

```
public ValidatePetRow(DataSource ds) {
    super(ds, "select * from PETS where NAME = ?");
    ...
}

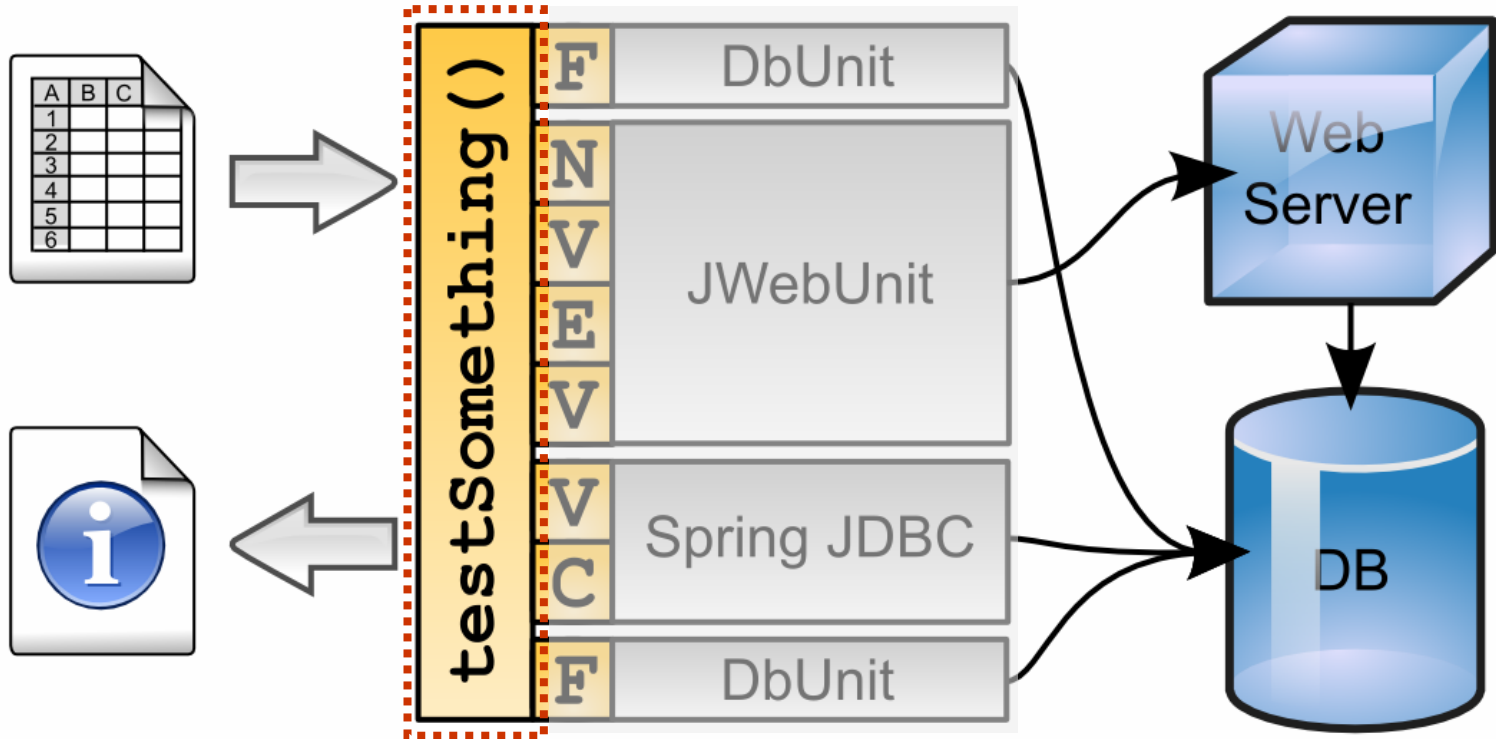
protected void validateRow(ResultSet rs, int rowNum) ... {
    assertEquals(ownerId, rs.getInt("OWNER_ID"));
    assertDatesEqual(birthdate, rs.getDate("BIRTH_DATE"));
    ...
}

protected void validateRow(ResultSet rs, int rowNum) ... {
    assertEquals(ownerId[rowNum], rs.getInt("OWNER_ID"));
    assertDatesEqual(birthdate[rowNum], rs.getDate("BIRTH_DATE"));
    ...
}

protected void validateRowCount(int numRows) {
    assertEquals(1, numRows);
}
```

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Testing with DDSteps



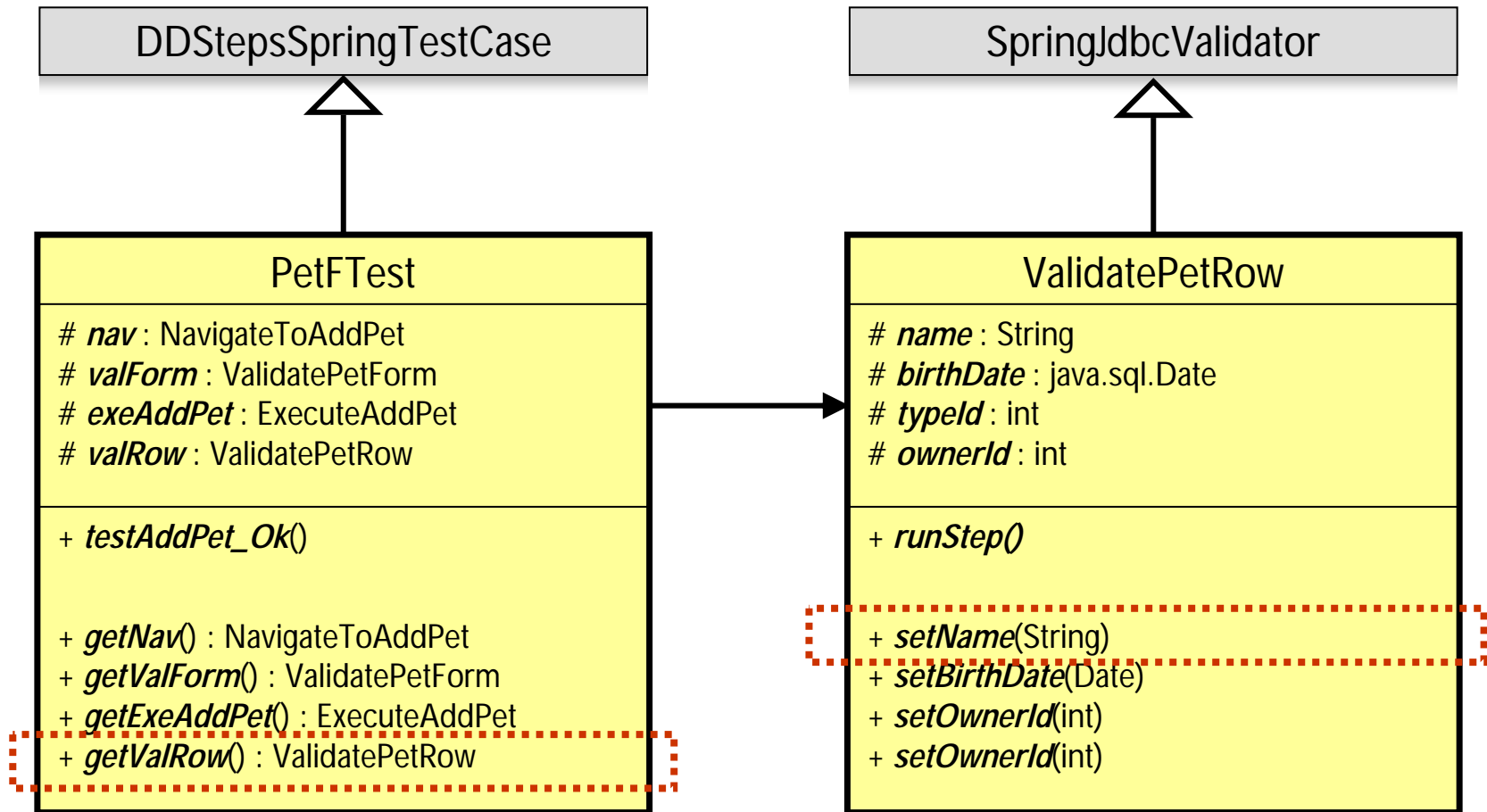
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The TestCase

```
public class PetFTest extends DDStepsSpringTestCase {  
  
    protected NavigateToAddPet nav;  
    protected ValidatePetForm valForm;  
    protected ExecuteAddPet exeAddPet;  
    protected ValidatePetOnOwnerPage valOwnerPage;  
    protected ValidatePetRow valRow;  
  
    public NavigateToAddPet getNav(...) {...}  
    public void setNav(...) {...}  
  
    public void testAddPet_Ok() throws Exception {  
        nav.runStep();  
        valForm.runStep();  
        exeAddPet.runStep();  
        valOwnerPage.runStep();  
        valRow.runStep();  
    }  
}
```



JavaBean Expression Language



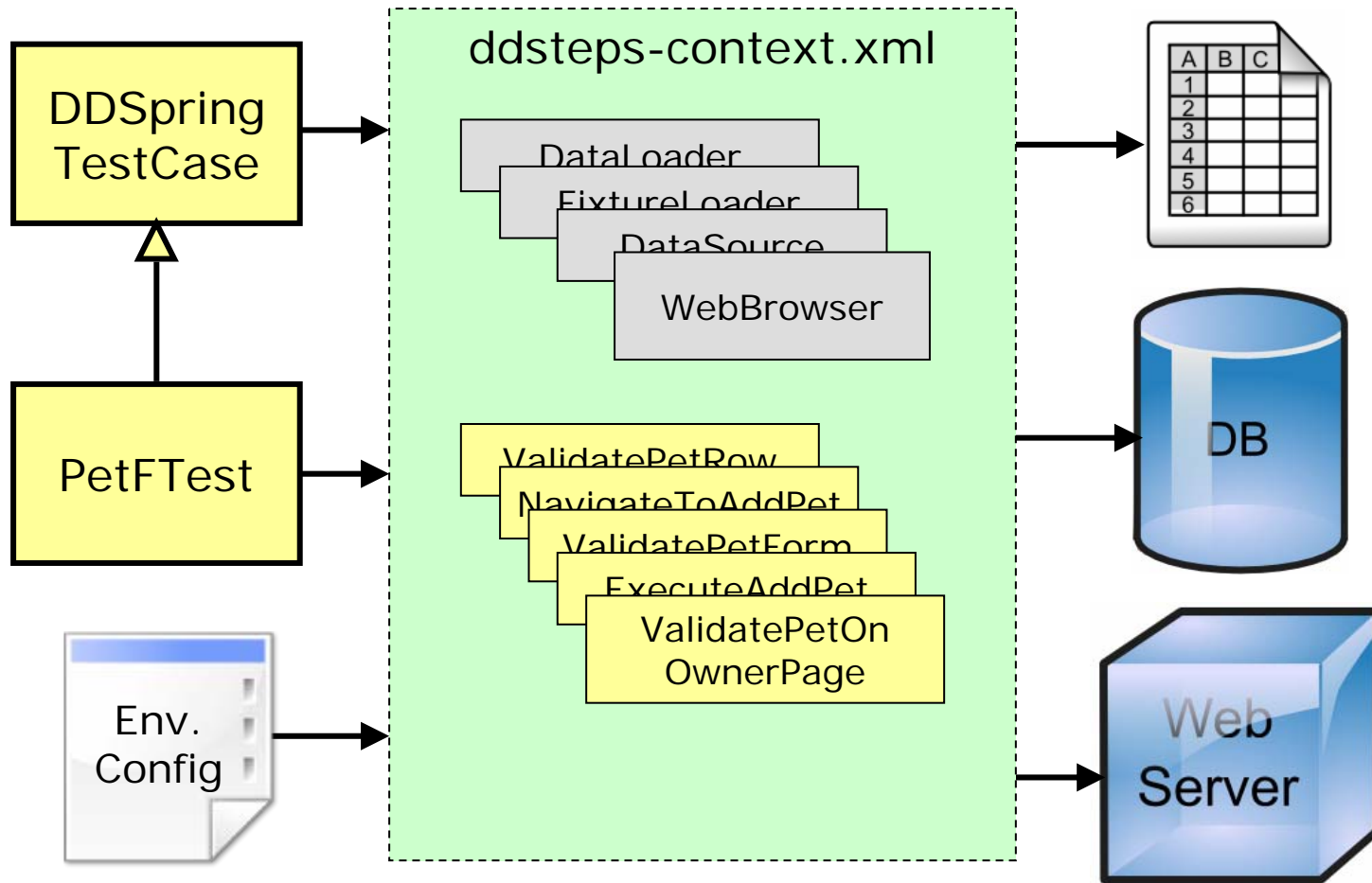
Column Header: `valRow.name`

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Web App Testing Demo

DDSteps, PetClinic and Eclipse

Spring Framework™ Powered



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Open APIs

:: Open API

- **TestStep**
- **DataLoader**
- **FixtureLoader**

:: Insert Your Technology Here...

- **EJBs**
- **Web Services**
- **Proprietary**
- **Legacy**

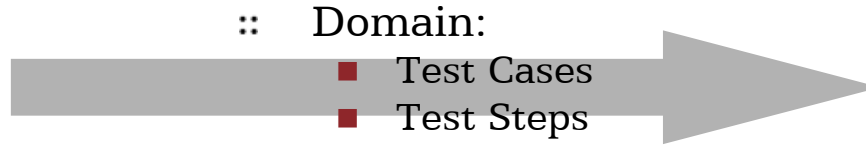
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Working with DDSteps

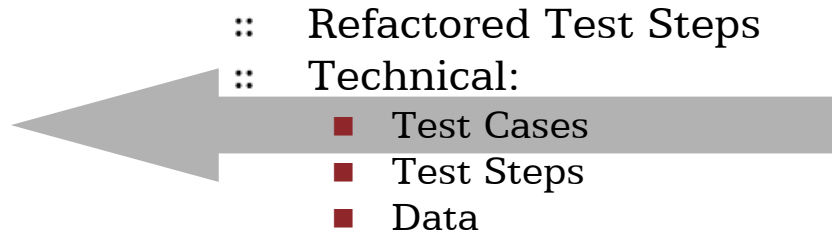
Agile & Continuous Testing



Tester



Programmer



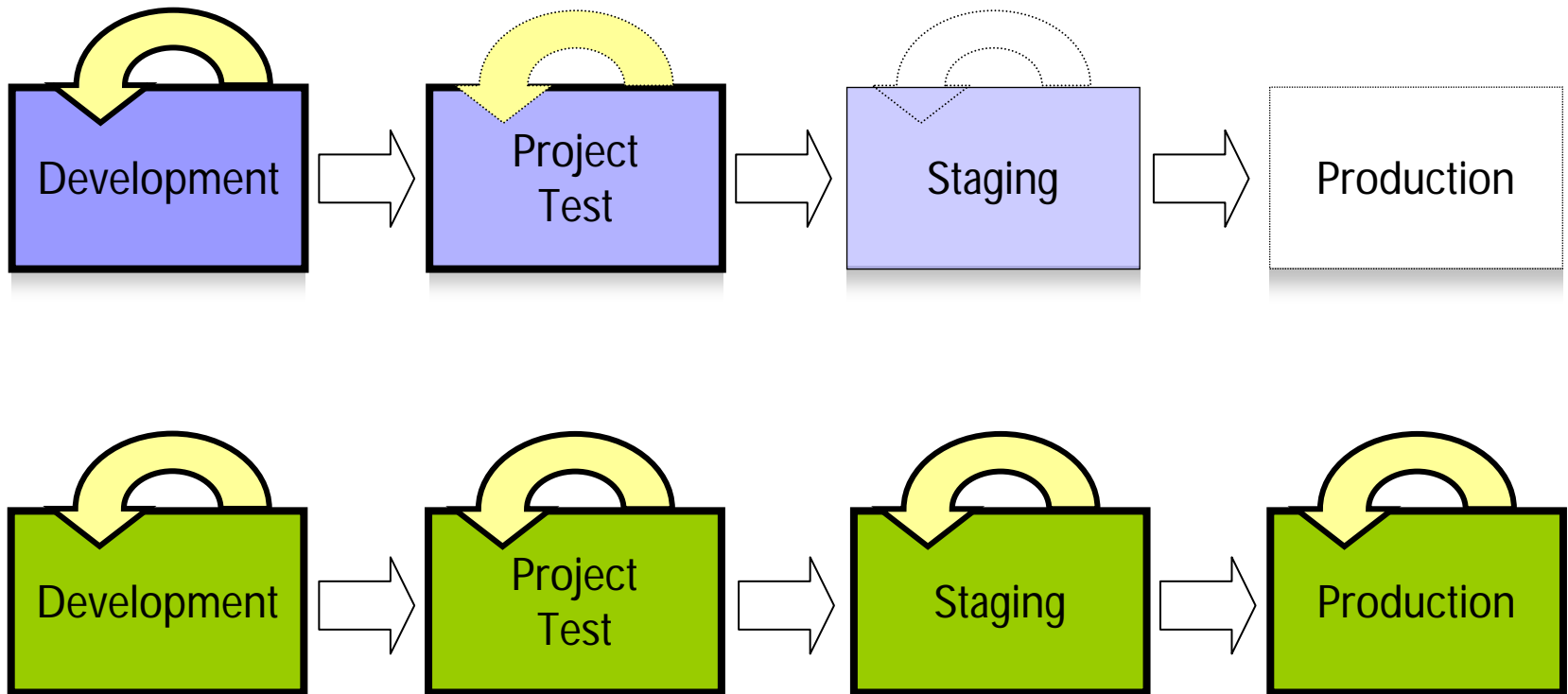
- :: Test Report
- :: Project Status



Project Leader

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Real Regression Testing



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DDSteps handles Large Projects

:: DDSteps Scales Well

- 3000+ Unit Tests
- 300+ Function Tests

:: Layered Fixtures

:: Layered Test Suites

- Smoke Tests
- Daily/Nightly Builds

:: Ant Utils (1.x)



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Surprise!

Bonus Demo

Summary

Yes, it's Open Source!

DDSteps is Open Source

:: Lesser GNU Public License

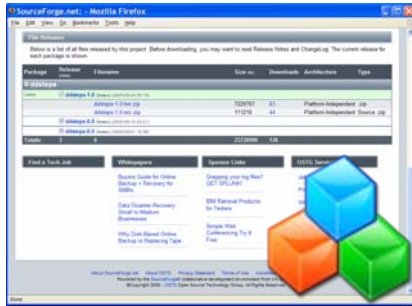
- No Evil Commercial Forks
- Open Co-Operation
- No "Class Path Exception" Needed

:: Professional Software

- Backed by Jayway
- Supported by Jayway
- Dedicated Developers
- Active Customers
- Active Users



DDSteps Community



SourceForge

ddsteps-user@lists.sourceforge.net



Web & Community

www.ddsteps.org



Tracking & Planning

jira.ddsteps.org

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DDSteps Releases

:: Pre-release 1.1.1

- Eclipse 3.2

:: Release 1.1

- June 2006
- LDAP
- Community
- Documentation
- Courtesy Classes
- **Samples**

:: Release 1.0

- September 2005

:: 1.x Series

- Large Projects
- Selenium™
- HttpUnit 2.0
- OpenOffice™

:: 2.x Series

- Smart Clients
- Java ME™
- JMS
- XML Data Loading
- JUnit 4
- TestNG

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Q & A

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